Phy.202 §102 (CRN 3583) 2015 Fall Syllabus (General Physics I Lab)

Course-Section Web Site: www.science.marshall.edu/foltzc/p20215f.htm

Class meets _T____ 10:00-11:50 in Science 100, from Aug.29 – Dec.08 (Exam 2)
Attendance at each lab meeting is required; you must do the lab work before reporting on it!
If you expect to miss a lab, contact me early so we might slip you into a different Lab section.
(Phy.202 Lab sections starting T.8, T.10, T.12, T.14, T.16 ; R.8, R.10, R.12, R.14)
I will supervise make-up opportunities every few weeks, on Friday/Saturday afternoon.
Exam 2 will occur during Finals Week on Dec.08, starting at 10:00am – alternative time at T.8.

Instructor: Dr. Curt Foltz ; Science 159 ; foltzc@marshall.edu ; (304) 696-2519
office hours: M_W_F 9:00–10:00 + 13:30–15:30 ; also _T_R_ 12:30–13:30 and ___R_ 10:30–11:30
other times by appointment or chance; see www.science.marshall.edu/foltzc

Catalog Course Description: PHY 202 General Physics Laboratory. 1 hr
Required of all students taking PHY 201 or PHY 211, unless exempt by special permission.
2 hrs. lab (CR: PHY 201 or PHY 211)

This lab course emphasizes physical concepts, over techniques of measurement and analysis, so is intended for Natural Science majors. It is a pre-requisite for Physics II and Physics II Lab. (for less math but faster pace with less depth, consider Phy.101 or PS 122 surveys)

Required workbook: Phy 202 Laboratory Manual 4th ed. by MU Physics Dep't, (Van Griner 2015)
calculator : non-programmable, with buttons (not menu) for EE or EXP , x^2 , $\sqrt{x}$, cos , $\sin^{-1}$
pen and pencil; pen for predictions, pencil is okay for data, calculations, and computation
attendance: (with pen, pencil, calculator, textbook) at each class meeting, ready to learn
time & effort: outside of class, 1 or 2 effective hours/week to write discussion & conclusions

Recommended: a positive attitude … to embed these concepts deeply, not waste your time.
preparation … some labs (esp. 2nd half) might be done before topics are covered in Lecture.
cooperation with lab partners … best way to learn is to teach, best instruction is by peers.
balance … between struggling to understand (yourself) , and asking when you don't.

Overview: Phy.202 is a hands-on "guided investigation" thru a few classic scenarios in kinematics & dynamics, oscillations & waves, and thermal phenomena. You'll do activities and copy data from the computer screen, by hand – in order to 1) recognize essential data features, 2) practice the effect-to-cause abstracting process, 3) explicitly ignore unnatural results. You'll thoughtfully describe, explain, and evaluate your results, to connect them to Physical theory. 202 labs concentrate on the most basic foundations, to make sure they are solidly understood – many lecture topics are ignored here – so doing well here is necessary, not sufficient, for 201.

Most work is to be done in-class. Predictions are to be yours, made solo; then discuss them with lab partners (typically trios). Data and results arise from cooperative effort - switch roles often among set-up, manipulation, and mouse-running. Trust your lab partners – skeptically. Verify! (redundancy will avoid most blunders) Try to reach consensus on explanations – but be picky! You're trying to teach these lab partners how to think about physics!

Much of each lab's Learning occurs while writing your conclusion. Write it by yourself (solo), outside of class, isolated from discussions with others about what "ought to be concluded". In the conclusion: mention what the lab was trying to demonstrate, summarize the results that your team obtained, comment on whether they are what *ought to be expected* based on theory, and either suggest why they are not, or what measurements make you most uncertain that they are (as expected). Multi-variable propagation of measurement uncertainties is overkill.

Much of each lab's Report Score is based on home-work (textbook) style calculation questions, that are related to the lab topic; these may be discussed with others, but only using words ! (no talking about numbers, or letter abbreviations, or math symbols – that's cheating).

Staple your Homework and Conclusion that lab's Worksheet set (including graphs, if asked for), and turn in the entire report at the beginning of the next lab meeting.
Do include your lab partners' names on the first page ("L.P: Jane D & Joe S")
You will receive the graded report at the next lab meeting – yes, 2 weeks after doing the lab.

Department policy requires 2 lab exams; nothing on the exams is to be discussed with others.
MY Exams will not be homework-style; they will include a hands-on "practical" portion.

Grade Components: 12 Lab Reports × 5% each = 60 %
2 Lab Exams × 20% each = 40 %

Letter Scale: 100% > A > 90% > B > 80% > C > 70% > D > 60% > F …
with the additional condition that you must pass (>60%) at least 1 Exam to pass the course, and the additional condition that you must have done (to conclusion) at least 9 of the labs.

date	lab # , title		
Aug.25	1 , Introduction to Motion		
Sep.01	2 , Accelerated Motion		
Sep.08	3 , Mathematical Description of Motion		
Sep.15	4 , Projectile Motion		
Sep.22	5 , Force and Motion		
Sep.29	6 , Circular Motion		
Oct.06	7 , Work and Energy		
Oct.13	8 , Collisions		
Oct.20	**Exam 1** , including Labs 1 – 6 (but not Lab 7)		
Oct.27	9 , Simple Harmonic Motion		
Nov.03	10 , Periodic Motion of a Pendulum		
Nov.10	11 , Longitudinal Waves and Sound		
Nov.17	12 , Temperature and Heat - turn in Friday!		
Nov.24	- no Lab (- Thanksgiving ! –)		
Dec.01	- Last Lab Make-ups – return Lab 12		
Dec.10	**Exam 2**, including Labs 7 – 12		

Some Student Learning Outcomes: based on the Attributes of Core II Physical & Natural Science

Student Learning Outcome	Practiced	Assessed
based on observation & measurement	each lab in workbook	conclusions, exams
control, manipulate, & measure via devices	each lab performance	exams
collect & analyze data, notice uncertainties	each lab in workbook	conclusions, exams
form hypotheses & design experimental tests	most labs performance	conclusions, exams
interpret & communicate results	each lab in workbook	exams
validity from calibration, precision, accuracy	each lab performance	exams
uncontrolled variables muddle interpretation	some lab performance	conclusions, exams
basic principles of equipment design & use	most lab performance	exams
explanation relates to concept via math logic	some labs in workbook	homework, exams
reasoning with correct vocabulary	each lab in workbook	conclusions, exams
numerical predictions of observable quantity	each lab in workbook	homework, exams

As you can see from the above table, the Exams are more important than any one Conclusion – so treat the conclusions as practice thinking (deeply about the experiment) before the Exams!

Statements that are valid for ALL Classes at Marshall:

These are printed in your MU catalog – the most recent version is on-line at
www.marshall.edu/catalog/files/UG_15-16_final_published.pdf

+ Academic Dishonesty Policy: progress in science is founded on honesty and openness – no lying, no cheating, no stealing (plagiarism) – zero tolerance!

+ Computing Services Acceptable Use Policy: don't "lend" your account, or send spam from it, or solicit from it … remember to LOG OUT before leaving the Lab!

+ Incomplete Grade Policy: to receive an "I", you must have completed ¾ of the course successfully (*i.e*, passing); course work must be completed within 1 semester (*i.e*, by Dec.11)

+ Students with Disability Policy: the student initiates procedures to document a disability, then request accommodations, thru the Office of Disability Services (Prichard 117).

+ Inclement Weather Policy: don't over-risk your safety to get to class